Rallytime GPS

GPS Synchronised Rally Clock

English Users Manual

Rev. 1.1

Contents

1.0 Introduction

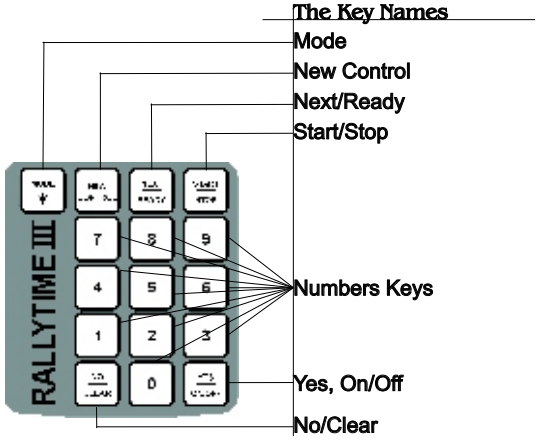
The Rallytime GPS is the third generation of the long established Rallytime series of clocks. It is an advanced global positioning system (GPS) synchronized rally timing device.

This version is superior to its predecessors in that the clocks are all synchronized to the same time stream, namely the signal from GPS satellites. This makes for far higher precision timing, and a resolution of one millisecond (0.001) for the flying finish.

It is designed to work in conjunction with many peripheral devices including infra - red light barriers, handheld remote stop push buttons, countdown displays, master time displays, countdown lights, computers and serial printers.

2.0 Getting Started

2.1 Keys



A List of Functions per Key

Mode Key: access control times, printout, clear memory, clock output and setup.

New Control Key: starts a new control.

Next/Ready Key: goes to the next car or press when ready.

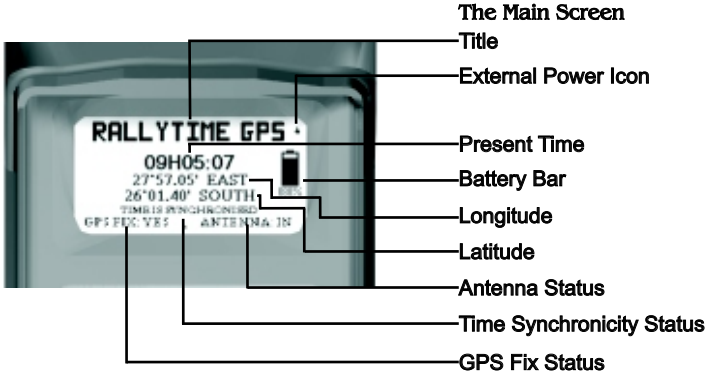
Start/Stop Key: used when cars start and stop.

Numbers Keys: use to input numbers.

Yes, On/Off Key: affirms and powers the clock on or switches it off.

No/Clear Key: refusal and clears input.

2.2 The Display



An explanation of the parts of the main screen

Title:	Is the title of the screen.
External Power Icon:	If external power is applied this icon appears.
Present Time:	The time.
Battery Bar:	Displays how much battery charge remains.
Longitude:	The longitudinal position of the clock.
Latitude:	The latitudinal position of the clock.
Antenna Status:	Displays if the GPS antenna is in, out, or broken.
Time Synchronicity Status:	Displays if the time is synchronised.
GPS Fix:	Displays yes if the clock knows where it is, else no

2.3 Basic Setup

Press the Mode key a few times to see what it does, here is a brief description of each function available through the Mode button:

Control times: allows for searching and viewing all saved controls and car times.
Printout: allows for RS232 output of all the saved rally data in various formats.
Clear Memory: wipes the memory clean, all saved car time data will be lost.
Clock Output: here you can select master clock, line printer or countdown output.
Setup: allows screen contrast and local time offset modification.

The control times function allows for searching for individual cars and their time at any given control or to view all cars and their times in that control.

The printout function allows the serial transmission of the rally data to a computer or printer. The available formats are Rallytime GPS csv for use in spreadsheets, Rallytime GPS report which is easy to read, and the old rallytime 2 printout for backwards compatibility with software already written for the previous generation of clocks.

The clear memory functions will clear the memory of the clock so that all car times and control data will be gone.

The clock output function lets you change what type of additional output the clock gives. Master clock will output the present time for use with a time display; line printer will output to a serial printer a line of data whenever car data is saved; and countdown clock will output to a countdown display the last 60 seconds of any countdown.

The setup function will let you change the screen contrast and change the local time offset for your region. That is GMT + or - your time-zone offset. (For South Africa this is GMT + 2.0 hours)

2.4 General Information

BATTERY INSTRUCTIONS
Please note that the Rallytime GPS has it's own internal battery pack which needs to be charged by using the mains charger or car charger supplied. The battery condition indicator indicates in % the remaining charge and when the battery is being charged. When the charge is getting low the battery bar will flash and when it its getting extremely low the clock will beep. When any accessories are attached then the cable harness will have 12V DC battery clips included which must be attached to a car battery or equivalent. The Rallytime GPS batteries will charge when the accessories are connected to a 12V supply.

INFRA-RED BEAMS
The infra-red beams are fitted to a base containing 12V DC dry cell batteries and a 220V mains charger. Please ensure that these units are charged on the mains for at least five hours before the rally. They have an on-off switch and should be able to run on the internal battery for at least ten hours. These high power beams have a maximum range of 200meters in clear air and will work in dust and rain over the 5 meters used in rally conditions. If used very close together or in a room check that they do not stay on due to backscatter of the infra-red light.

2.5 Pre-control Setup

When you use the Rallytime GPS for the first time or when the control is set up, switch on and plug in the GPS antenna. The display will indicate when the antenna is attached. Wait for up to twelve and a half minutes for the time and position to synchronise. Note that it is not possible to get a fix or for the time to synchronise indoors. After a GPS fix is indicated and the time has synchronised unplug the antenna and put it away safely. The antenna cable is very easy to break and can break if kinked so be careful. The Rallytime GPS timebase has now been set and runs on it's own internal precision clock.

Every time you start a new control you should plug in the antenna and get a GPS fix. This is to ensure that the time is synchronised.

3.0 Start Stage

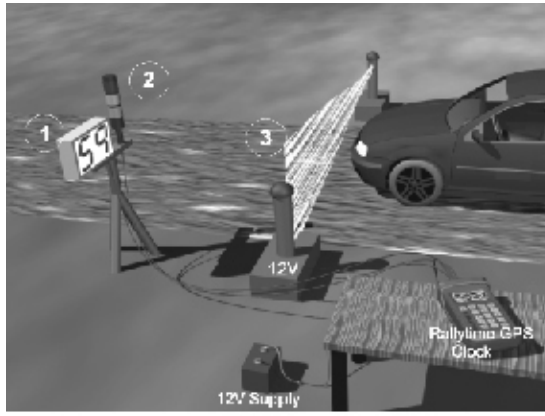
Press New Control, if the time is not synchronised you will be warned, but may continue by pressing Yes, then enter your marshal number then Yes. Enter the control number, then Yes. Press Yes for Start Stage. If the Information displayed now is correct press Yes else No to reenter the control and marshal numbers.

When the first car is ready enter its number and press Yes. You will be prompted for when it is scheduled to leave. Enter the time in HH:MM:SS (seconds will be 00 if not set) and press Yes. The clock will count the car down.

(Note: if the starting lights are set up they will light up Amber at 30, 20, 10, 5, 4, 3 then Red-Amber-Green. Secondly if the countdown display is set up it will count the last minute down 59 - 00. Countdown output is auto-selected in the Start Stage but can be changed through the mode key)

If while counting down, you wish to abort, press the Start/Stop or the remote stop push button, however if it is pressed within the last 5 seconds the countdown will continue and the time will be recorded as a jumped start time.

Peripheral devices that can be used here.
1. The countdown display: counts down the last minute (see 2.3).
2. The countdown lights: starts each car with Red, Amber and Green lights.
3. The infra-red light barrier can be used for jumped starts.
4. The line printer: to get a hard copy of each car that starts.(cannot be used if the countdown display is connected.)



The typical peripheral setup for a start stage

After the last car, close the stage by pressing No then Yes when prompted to "Close Control?", Then Yes to "Are you sure?".

4.0 Flying Finish

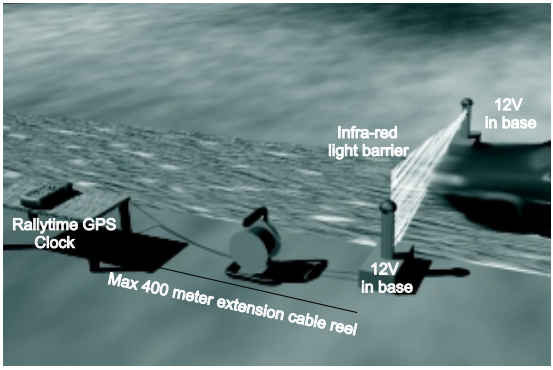
Press New Control, if the time is not synchronised you will be warned, but may continue by pressing Yes, enter your marshal number then Yes. Enter the control number, then Yes. Press No then Yes for Flying Finish. If the Information displayed now is correct press Yes else No to re-enter the control and marshal numbers.

The clock is now waiting for a car to cross the finish line. When you press Start/Stop, or the remote stop push button, or the infra-red beam is broken, the time is recorded in HH:MM:SS.XXX and you must now enter the number of the car that just went by. Press Yes when done. Line printer is auto-selected in flying finish and will print the car number and time if connected to the Rallytime GPS.

If, while entering the car number, another car crosses the line, press the Start/Stop button and its time will also be recorded. Up to 15 cars can be stored in short-term memory this way. For each press of the Start/Stop button you will need to enter a car number and press Yes in sequence.

Further with each car number correctly saved the unit can output to a line printer.

Peripheral devices that can be used here.
The remote stop push button: does the same as the Start/Stop button.
The infra-red light barrier: does the same as the Start/Stop button.
The line printer: to get a hard copy of each car that passes.
The 400 meter extension cable reel.



The typical peripheral setup for a flying finish

After the last car, close the stage by pressing No then Yes when prompted to “Close Control?”, Then Yes to “Are you sure?”.

5.0 Stop and Time Controls

Press New Control, if the time is not synchronised you will be warned, but may continue by pressing Yes, enter your marshal number then Yes. Enter the control number, then Yes. Press No then No then Yes for Stop Control.

Press New Control, if the time is not synchronised you will be warned, but may continue by pressing Yes, enter your marshal number then Yes. Enter the control number, then Yes. Press No then No then No then Yes for Time Control.

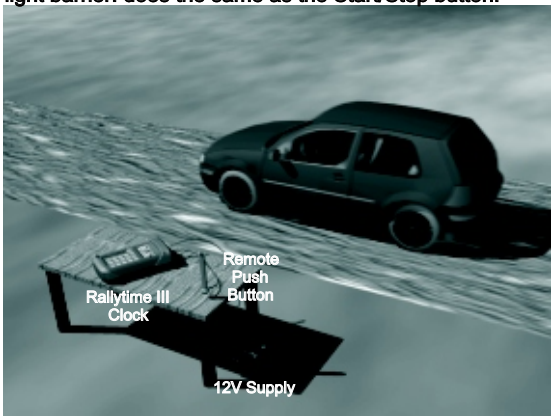
If the Information displayed now is correct press Yes else No to re-enter the control and marshal numbers.

When a car arrives press Start/Stop or the remote stop push button. The time is recorded in HH:MM:SS and you are prompted for the cars' number. Press Yes when done. Line printer is auto-selected in stop/time controls and will print the car number and time if connected to the Rallytime GPS.

If, while entering the car number, another car drives by, press the Start/Stop button and its time will also be recorded. Up to 15 cars can be stored in short-term memory this way. For each press of the Start/Stop button you will need to enter a car number and press Yes in sequence.

Further with each car number correctly saved the unit can output to a line printer.

Peripheral devices that can be used here.
The line printer: to get a hard copy of each car that passes.
The remote stop push buttons: does the same as the Start/Stop button.
The infra-red light barrier: does the same as the Start/Stop button.



The typical peripheral setup for stop and time controls

After the last car, close the stage by pressing No then Yes when prompted to "Close Control?".

6.0 Printouts

Select the printout format through Mode... Printout... Yes. You may connect the clock directly to a a line printer or to a computer and use the Rallytime GPS Receiver software to capture the data for printing and analysis.

6.1 Rallytime GPS Reciever Quickly Explained

The simple reciever software works as follows: it automatically recieves the data from a Rallytime GPS clock and then saves the data to file and then executes that file.

To receive data, click Communications, Connect, then select 1,2 or 3 as the format on the clock.

To change the comport settings, click Communications, Setup.

The automatically saved files are placed where you installed the software to, usually c:\Program Files\

6.1 Rallytime GPS CSV

Press Mode, Mode, Yes, Yes then 1 on the clock for the Rallytime GPS CSV format. The clock will transmit the rally data to the reciever and then

Here is an example of the csv output.

6.2 Rallytime III Report

Using the simple Rallytime III Receiver software you will be able to acquire the Rallytime III Report from the clock, ready for printing.

Please turn over for an example of the Rallytime III Report output.

```
                    RALLYTIME
                       III
                  RALLY  REPORT

                    16 FEB 2004

              FROM UNIT: 20040216

                    Control: 01
                    Start Stage
                   Marshall: 07
  Located at: 27°57'05" East 26°01'41" South
       Started at: 08H51 on 16 FEB 2004

                  -------------------
                       Car Times
                  -------------------
Car: 001  Time: 08H52:55  Jumped: 05 seconds.
Car: 002  Time: 08H53:30  Jumped: 00 seconds.
Car: 003  Time: 08H54:00  Jumped: 00 seconds.
                  -------------------
                  Ends Car Times
                  -------------------

         Ended at: 08H54 on 16 FEB 2004

                    Control: 02
                   Flying Finish
                   Marshall: 07
  Located at: 27°57'05" East 26°01'41" South
       Started at: 08H55 on 16 FEB 2004

                  -------------------
                       Car Times
                  -------------------
Car number: 001          Time: 08H55:19.847
Car number: 002          Time: 08H55:25.308
Car number: 003          Time: 08H55:30.766
                  -------------------
                  Ends Car Times
                  -------------------

         Ended at: 08H55 on 16 FEB 2004

                    Control: 03
                   Stop Control
                   Marshall: 07
  Located at: 27°57'05" East 26°01'41" South
       Started at: 08H55 on 16 FEB 2004

                  -------------------
                       Car Times
                  -------------------
Car number: 001          Time: 08H55:57.725
Car number: 002          Time: 08H56:00.528
Car number: 003          Time: 08H56:03.697
                  -------------------
                  Ends Car Times
                  -------------------

         Ended at: 08H56 on 16 FEB 2004

                    Control: 04
                   Time Control
                   Marshall: 07
  Located at: 27°57'05" East 26°01'41" South
       Started at: 08H56 on 16 FEB 2004

                  -------------------
                       Car Times
                  -------------------
Car number: 001          Time: 08H56:21.026
Car number: 002          Time: 08H56:24.369
Car number: 003          Time: 08H56:32.985
                  -------------------
                  Ends Car Times
                  -------------------

         Ended at: 08H56 on 16 FEB 2004

              END OF RALLY REPORT
```

6.3 Rallytime II Report

This report is provided to ensure backwards compatibility with software already written for the Rallytime II clocks.

Here is an example of the Rallytime II Report output.

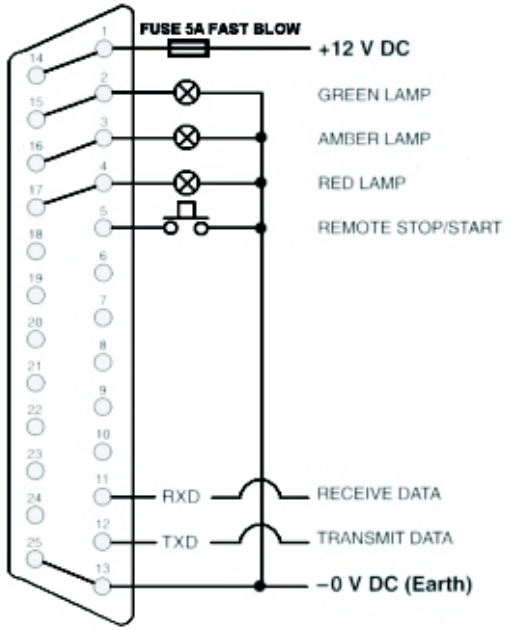
```
----------------------------------------
CONTROL POINT NUMBER : 04
CONTROL POINT TYPE   : TIME CONTROL
MARSHALL NUMBER      : 07
----------------------------------------
       CAR No.           TIME
----------------------------------------
      #  001  .....08h56:21.02
      #  002  .....08h56:24.36
      #  003  .....08h56:32.98
----------------------------------------
   --       END OF CONTROL       --



----------------------------------------
CONTROL POINT NUMBER : 03
CONTROL POINT TYPE   : STOP CONTROL
MARSHALL NUMBER      : 07
----------------------------------------
       CAR No.           TIME
----------------------------------------
      #  001  .....08h55:57.72
      #  002  .....08h56:00.52
      #  003  .....08h56:03.69
----------------------------------------
   --       END OF CONTROL       --



----------------------------------------
CONTROL POINT NUMBER : 02
CONTROL POINT TYPE   : FLYING FINISH
MARSHALL NUMBER      : 07
----------------------------------------
       CAR No.           TIME
----------------------------------------
      #  001  .....08h55:19.84
      #  002  .....08h55:25.30
      #  003  .....08h55:30.76
----------------------------------------
   --       END OF CONTROL       --



----------------------------------------
CONTROL POINT NUMBER : 01
CONTROL POINT TYPE   : STAGE  START
MARSHALL NUMBER      : 07
----------------------------------------
       CAR No.           TIME
----------------------------------------
      #  001  .....08h52:55.01
      #  002  .....08h53:30.00
      #  003  .....08h54:00.00
----------------------------------------
   --       END OF CONTROL       --
```

7.0 Specifications

7.1 General

Display:	128 X 64 graphics display with backlight
Keypad:	16 embossed tactile keys
Batteries:	NiMH battery pack with temperature protection
Battery Life:	Approximately 24 hours
Dimensions	85 X 156 X 42 mm
Weight::	340 g
Protection:	UL 94 V-0 flame retardant ABS plastic with rubber boot
Operating Temperature Range:	0 to 50°C
Service Temperature Range:	-5 to 55°C
Storage Temperature Range:	-20 to 55°C
Acceptable Humidity:	< 85% non-condesing
Antenna:	Active antenna with an MCX connector
Antenna Placement:	Clear to the sky
Global Positioning System:	16 channel low power GPS, updating position at 4 Hz
Serial Output:	RS232, 9600, 8 data bits, 1 stop bits, no parity or flow control
Connector	DB25 female (cable side) please turn over for pinouts

7.2 Pinouts


FUSE 5A FAST BLOW
+12 V DC
GREEN LAMP
AMBER LAMP
RED LAMP
REMOTE STOP/START
RXD
RECEIVE DATA
TXD
TRANSMIT DATA
–0 V DC (Earth)
1
2
3
4
5
6
7
8
9
10
11
12
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